

106195778



US006179889B1

(12) **United States Patent**
Liu

(10) Patent No.: **US 6,179,889 B1**
(45) Date of Patent: **Jan. 30, 2001**

(54) **VACUUM CLEANER TANK ASSEMBLY**

(75) Inventor: **Li Liu, Tucson, AZ (US)**

(73) Assignee: **Shop Vac Corporation, Williamsport, PA (US)**

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

(21) Appl. No.: **09/348,893**

(22) Filed: **Jul. 7, 1999**

(51) Int. Cl.⁷ **B01D 46/02**

(52) U.S. Cl. **55/368; 55/374; 55/378;**
55/DIG. 2; 55/DIG. 3; 15/352

(58) Field of Search **55/368, 374, 378,**
55/491, DIG. 2, DIG. 3; 15/347, 352

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,784,800	3/1957	Segesman	183/43
3,142,857	8/1964	Fresard et al.	15/327
3,209,523	* 10/1965	Smithson	55/DIG. 2
3,350,857	11/1967	Fesco	55/363
3,375,541	* 4/1968	Fromknecht	55/378
3,597,903	8/1971	Schaaf	55/341
3,675,399	7/1972	Westergren	55/357
3,812,659	5/1974	Westergren et al.	55/375
3,830,043	8/1974	Nielsen et al.	55/378
3,870,491	3/1975	Friesen et al.	55/376
4,381,192	4/1983	Grimard	55/376
4,469,498	9/1984	Fish	55/335

4,591,369	5/1986	Stewart, Sr. et al.	55/374
4,699,641	10/1987	Barnes, Jr.	55/480
4,738,697	4/1988	Westergren	55/376
4,877,432	10/1989	Lackner	55/375
4,961,765	* 10/1990	Gühne et al.	55/374
5,057,131	10/1991	Lackner et al.	55/369
5,064,455	11/1991	Lackner	55/375
5,089,038	2/1992	Kopco et al.	55/374
5,092,915	3/1992	Lackner	55/375
5,464,460	11/1995	Bosses	55/374
5,544,385	* 8/1996	Jailor et al.	55/378
5,792,224	8/1998	Fu et al.	55/375

* cited by examiner

Primary Examiner—C Upton

(74) *Attorney, Agent, or Firm—Marshall, O'Toole, Gerstein, Murray & Borun*

(57) **ABSTRACT**

A vacuum cleaner filter bag retainer includes slots on each side which receive a cardboard plate attached to a filter bag. The plate is slid into the slots of the filter bag retainer such that openings in the plate and bag match with an opening in the filter bag retainer. The retainer is attached to a tank through an opening in the tank, and an inlet fitting extends from outside the tank, through the retainer, and into the bag. The inlet fitting, therefore, prevents the bag from sliding out of the slots in the retainer. A swivel fitting loosely traps the inlet fitting adjacent the filter bag retainer through threads on the swivel fitting and the retainer. The inlet fitting also holds a hose to the inlet fitting.

10 Claims, 5 Drawing Sheets

